COMPUCOLOR AND INTECOLOR USER'S BULLETIN

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EDITORS CORNER

WELCOME

We would like to welcome a lot of new members including some Universities in Kentucky, Canada, and Australia. We hope they will make use of our free program exchange so we can get some new programs with as Doug Peel would say " A foreign Flavor ".

NEW PROGRAMS

As you will notice in the new program section that we have a few new ones. Included amongst them are some long awaited Health Disks.

LOWER PRICES

We have been plauged by the rising cost of preparing new disks. It was costing us about $500 per each disk we prepared and with an average sale of 8 to 10 each there was no way we could break even. We have found the solution. Most of disks have been jammed full with 6 to 20 programs each. This means we have more problems with people not being able to read the inner tracks and those menus and descriptions take up to 8 hours each to prepare. In the future we will reduce the number of programs on each disk and will in many cases drop the menu. This will reduce the cost of disk preparation dramatically and our prices will be able to be brought down. Each disk will be individually priced and priced at about $25.00 instead of $35.00. We will come much closer to breaking even, even with low volumne on each disk.

MEMORIES

We still have 16k memories for sale for $210.00. They will work in either a Compucolor or a 3621.

LOWER CASE

Still available for $100. 00 for the above two machines.

PADDLES

Game or Educational paddles still available.

WORD PROCESSOR

Our new Word Processor and print driver is now avialable. For those who have purchased the print driver from us if you will send us back a copy of it (and the receipt) and $25.00 we will send you UPS prepaid a copy of the updated version. It prints much faster, to screen and printer at the same time, and right justifies as well as jumping to a desired page within a source code to start printing.

UNRETURNED DISKS

We are about caught up. We have paddles, memories and all promised disks in stock. (Except any unreleased ISC disks for which refunds should have been issued.) If we owe you anything either because you ordered it or you have a free disk coming please let us know. It is against our company policy to screw anyone out of anything we feel they have coming. Again we ask if we owe you a disk let us know and we will take care of it.

NEW MATERIAL

As usual we need more material. We would like to get copies of some other group's bulletins and permission some of the articles Remember the limitation on issueing bulletins is the availability of material to go into them.

GENESIS 2

For those into handicapping we now support the Genesis machines. We will not comment on the guy selling then or how good they are, just that we support them.

CHESS

A quick perusal of the disk section will reveal we have finally released our long awaited version of chess. It's pretty good. It's been out for a while and no complaints about bugs so far.

EPSON PRINTER

Fantastic news. We have just completed an interface between the EPSON MX 80 printer and the Intecolor or Compucolor. It solves all the problems that have plagued MX80 users, (Garbage to the screen.) Our price for an MX80 complete with the cable, interface and a disk for the Compucolor is $750. If you have purchased a MX80 from us and want to retrofit the new interface to it give us a call and we will see if we can work some thing out. We will sell the interface without the printer but we have $4500 worth of engineering to recover so its not cheap. (I guess that depends on your point of view as we have already sold some that way.) As far as we are concerned the MX80 is still the best we have seen. There may be others on the way but they are not here as yet.

UPCOMING DISKS AND ARTICLES

We have a few programs on plotting. If we can duplicate it John Rhodes monitor updates. John Rhode's Graphic Clipping Routines. We have also been given permissionby a Non US group to reprint some of their better material. There have been a number of programs submitted including what look to be some really good ones from Australia. Keep them coming in.

MONEY PROBLEMS

We have had complaints from some countries that they have currency restrictions and can't send cash in advance. We will accept letters of credit on orders of over $100. (We will have to add some at this moment unknown cost though.) I will comment that that's the silly way to get out programs. You mention that you have lots of good business programs and you would like to add ours to your list. It would be difficult to sell your prorams in the USA so why bother trying. Why not just trade programs with us. As I once said to a little girl when I was only 6 years old "Let me see yours and I'll let you see mine. " No money need change hand. If neccessary B of A and MC are OK.

KEYBOARD SCANNING

by John W.Rhodes

Sometimes when you are writing a program you want keyboard input without the limitations imposed by the BASIC INPUT command. BASIC echoes everything to the CRT and waits for you to hit RETURN before it evaluates the input. When you find yourself in this predicament you can do what you usually (should) do to get around BASIC - you do some of the program in assembly language. One of the early COLORCUEs (Vol.I,No.2,Nov 78) presented the basic (not BASIC) routine for preventing CRT echo. Whenever the keytest routine detects and evaluates a valid key closure it sets a keyboard ready flag. The routine involves calling the keytest routine and then zeroing the ready flag. You still have the character available in the keyboard character pigeonhole. In assembler nmemonics the routine goes as follows:

```
KEYTEST EQU  0024H  ;KEYBOARD TEST
KEYFLAG EQU  81FFH  ;READY FLAG (33279)
KEYCHAR EQU  81FEH  ;CHARACTER PIEGONHOLE
  (33278) Not used but that's where it is.

START:  PUSH    PSW
        PUSH    H
        PUSH    B          ;SAVE REGISTERS
READ:   CALL    KEYTEST ;READ CHARACTER
        JNZ     READ       ;CHAR NOT READY
        MOV     E,A        ;PUT IT IN <E>
        XRA     A          ;CLEAR <A>
        MOV     D,A        ;BASIC READS <D,E>
        STA     KEYFLAG ;ZERO READY
        POP     B
        POP     H
        POP     PSW        ;RESTORE REGISTERS
        RET                ;RETURN
```

This routine occupies 19 bytes, so you would push the end of BASIC back 19 bytes (e.g. from 49151 to 49132 if you have a 16K CC II) and poke the routine in that area. You would then set up the user call to the routine. Thus:

```
POKE 32940,236:POKE 32941,191:REM MOVE END OF BASIC
POKE 33283,237:POKE 33284,191:REM SET USER CALL
RESTORE:FOR I=49133 TO 49151:READ A:POKE I,A:NEXT I
DATA 245,229,197,205,36,0,194,240,191,95,175,87
DATA 50,255,129,193,225,241,201
```

This works fine if you still want to hit the key many times (or hold the repeat key) for a sustained input. Recently I was trying to do a racecar game and use the '1' key to move the car left, the '2' key to move the car right, and no key depressed for the car to move ahead straight (I should have had a joystick). I used the above routine and everytime I held the '1' key down the car moved left one move and returned to going straight.

KEYBOARD SCANNING - continued

To explain the above behavior I must say a few words about how the keyboard works on the Compucolor. If you've looked in the Maintenance Manual you know that the keyboard is interfaced through the TMS 5501 I/O Controller. In the appendix on the 5501 the manual says that an external sensor (keyboard) causes an interrupt and jump to location 10H. It further says that Interval Timer 3 services the repeat key with a jump to 18H. Forget it. The routine at 10H is caused by a timer and updates the Real Time Clock. The keyboard does not cause an interrupt, but everytime Interval Timer 3 times out (every 2 milliseconds) the keyboard is scanned.

Every key on the keyboard is assigned a number and the scanner routine (18H) looks for key closure. If it detects a key closed it stores the key number in a RAM piegonhole. It then goes on to look for any more keys closed. If it finds another it stores that number in a second piegonhole. Nothing more happens on this scan but on the next scan the same thing occurs. If more than one key is pressed (not counting Shift/Control) then the keysare ignored. But if only one key is pressed and it is the same key as the last scan, then a counter is incremented. If this happens on a number of scans (I think it is six) then a valid keyclosure is declared. The sequential comparison bit is how the keyboard is debounced.

If a valid key closure is declared then the keyboard is checked for Shift/Control/Repeat attributes. The S/C attributes are used to develop the unique character value for the input. This value is compared with that in the character piegonhole. If it is the same (meaning a key was held depressed) then the repeat attibute must be present to set the ready flag. If the character values differ then the new character is put in the character piegonhole and the ready flag is set. Simple.

Since I do not care about the character value or whether or not more than one key is pressed the answer was to have my user call routine call the keyboard scan routine. It then zeroes the keyboard character piegonhole so that even if a ready flag is presented to BASIC the character is the null character (zeroing the ready flag does not work with this routine). Back in BASIC I peek the value in the scan piegonhole (33238 or 81D6H) to see what key was pressed.

```
KEYSCAN  EQU   0018H     ;THE SCAN ROUTINE
KEYCHAR  EQU   81FEH     ;CHARACTER PIEGONHOLE

START:   PUSH  PSW       ;SAVE <A>
         CALL  KEYSCAN   ;SCAN THE KEYS
         XRA   A         ;ZERO <A>
         STA   KEYCHAR   ;ZERO KEYCHAR
         POP   PSW       ;RESTORE <A>
         RET
```

KEYBOARD SCANNING - continued

This is a 10 byte routine so:

```
POKE 32940,245:POKE 32941,191
POKE 33283,246:POKE 33284,191
RESTORE
FOR I= 49142 TO 49151
READ A:POKE I,A:NEXT I
DATA 205,24,0,245,175
DATA 50,254,129,241,201
```

The scan value set ignores the Control/Shift/Command or Caps Lock attributes and uses a different set of numbers than the normal keyboard (ASCII) values. See the table for the raw keyboard values.

P.S. Both routines might garbage the screen from inputs when BASIC is doing other processing so it is best to lockout the keyboard (disable Timer 3 interrupt) when not using the user call routines. The keyboard lockout is OUT 8,247 and the enable is OUT 8,255. Thus:

```
OUT 8,255:Y=CALL(0):OUT 8,247
```

Good Luck.

RAW KEYBOARD VALUES

Key: 0 thru 9	16 thru 25
: ; , - . /	26,27,28,29,30,31
@ thru Z	32 thru 58
[/] ↑ _	59,60,61,62,63
F0 thru F15	64 thru 79

BY DENNY HUGG

ANIMATION: STEP 1

How to plot a moving dot

THE MANUAL SAYS that, WITH the [redacted] FLAG bit set at 1, the second TIME A LOCUS is plotted it WILL ERASE, SO...

```
10 PLOT 30
15 LET Y=66
20 FOR X=20 TO 120
25 PLOT 2: PLOT X: PLOT Y: PLOT X+1: PLOT Y: PLOT 255
30 NEXT X
999 END
```

FOR A SMOOTHER, MORE FLUID PRESENTATION CHANGE #25 to

```
25 PLOT 2: PLOT X+1: PLOT Y: PLOT X: PLOT Y: PLOT 255
```

CONT. ON PAGE 8

CARTER OBSERVATORY
WELLINGTON, 1
NEW ZEALAND

All Correspondence to be addressed to DIRECTOR

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NEW ZEALAND

1980 October 31

Mr S. Pro,
Compucolor Users' Group,
5250 Van Nuys Blvd.,
Van Nuys, Calif. 91401,
U.S.A.

Dear Mr Pro,

Brighterwriter

We have purchased the graphics option with the Brighterwriter IP-255 "Paper Tiger" printer plotter. Your note in the March issue on this helped to get us on the right track for using it. However a couple of hints learnt by us for using all its facilities in conjunction with the Compucolor II should help others.

(1) To use enhanced mode, requires "control A", which is used by Compucolor for other purposes. Solve this via immediate basic line
C$ = CHR$(1) : PRINT C$; "NOW"
to put into enhanced mode, provided the dip switches of the Brighterwriter have been set to accept control characters and the device is enabled.

(2) Return to normal mode via
C$ = CHR$(2) : PRINT C$; "NOW" etc

(3) Graphics use from the keyboard requires
"control C" , "control M", "control C"
rather than just "control C", for the first use of graphics on power up.

(4) Graphics via BASIC statements, requires a further "control M" character
e.g. C$ = B$(3) + B$(13) + B$ (3) + B$(13)
where B$(n) = CHR$ (n)
to set graphics on device, subsequent characters are then plotted as appropriate, provided string terminated with
C$ = C$ + B$(3) + B$(11)

Yours sincerely,

B M Lewis

B.M. Lewis
Director

BELL MODIFICATION CORRECTION by Rick Manazir

Dear Stan

I just finished adding a bell to my CCII. I did find a mistake in the schematic provided by Carl Hennig in Volume 3 No 4 Issue 12. In order for the bell to perform correctly the 555 timer meust be set up for monostable operation. The schematic in the referenced issue shows the 555 timer in the time delay mode. To set the timer up for monostable operationconnect a jumper between pin 6 and pin 7. Attached is a corrected schematic for adding a bell to the CCII.

For anyone who hav tried to use Carl Henning's schematic, it provide a clicking sound when Plot 7 or Print CHR$(7) is used. The best method to determine what is happening is to hold the space bar down and the repeat key. 1The entire circuit can be built for under $10 and fits right in the keyboard. This is a far cheaper price thanthe $60 COM-TRONICS is charging and requires just a little more work than to install the COM-TRONICS device.

I would also like to order the BASE 2 graphics disk. Enclosed is a check for $25. I did buy my Base 2 from you a year ago.

NOTE For schematic refer to referenced issue.

ANIMATION CONT

TO ERASE THE RESIDUAL POINTS PRESENT AFTER COMPLETION OF ALTERNATE CYCLES ADD:

```
50 PLOT 2: PLOT 20: PLOT Y: PLOT 121: PLOT Y: PLOT 255
```

TO PLOT A BEAM OR LINE, SUCH AS A 'LASER OR ENERGY BEAM'

```
05 FOR T=1 to 2
10 PLOT 30: REM PLOT 30 SETS FLAG BIT TO 1
15 LET Y=66
20 FOR X=20 TO 120
25 PLOT 2: PLOT X: PLOT Y: PLOT X+1: PLOT Y: PLOT 255
30 NEXT X
40 PLOT 2: PLOT 20: PLOT Y: PLOT 121: PLOT Y: PLOT 255
50 NEXT T
999 END
```

(CONT PAGE 15)

PROGRAMS OF MEDICAL INTEREST

This disk contains seven programs. The MENU allows you to select any of them either in english or spanish.

1- OSMOLALITY ESTIMATION

Determines Serum Osmolality from plasma sodium, BUN and glucose values.

2- OLIGURIA EVALUATION

This program is adapted from an original program for T.I.59 written by T. E. Harrison, M.D. It computes several serum and urine values and determines the probable cause of oliguria.

3- ACID-BASE STATUS (arterial blood)

4- ACID-BASE STATUS (venous blood)

From known pH and PCO_2 of either arterial or venous blood, a complete report of acid-base status is obtained, with diagnosis of alteration, degree of compensation (if any) and total bicarbonate deficit calculation.

The report can be reproduced in a $Base_2$ printer at a 9600 baud rate.

5- CREATININE CLEARANCE

Modified version from the article by M. Pulier, M.D. published in Physician Microcomputer Report, vol.2 N°11, jan.1980.

Calculates predicted and adjusted Creatinine Clearance and helps to rule-out laboratory errors.

6- BODY SURFACE AREA

Calcualtes total body surface area applyng the original formula of Du Bois and Du Bois

7- TUBULAR REABSORPTION OF PHOSPHATE

Determines percentage of phosphate reabsorved by the kidney in 24 hours. Usefull in Parathyroid gland evaluation.

Guillermo Moros, M.D.

SOFT WARE HANDSHAKE

& OTHER COMMENTS

I have only recently joined your user's group, but I am not new to CompuColor. I have had my unit for about 18 months. I am a free lance consultant and use the CompuColor to mockup other systems. I have programed for mumeroussystems ranging from TRS 80 to IBM 370's.

There is little doubt that the Compucolor is by far the most cost effective unin in it's class on the market. Unfortunately it has one drawback.

Unfortunately, it appears that ISC either does not have the resources to exploitthis superiority or they have not quite realized its potential to surpass the other units on the market. As a result CompuColor owners suffer froma lack of recognition and periphial support. It is quite easy to find light pens, Digitizers, and even hard disks for TRS-80 or Lpple but nothing for CompuColor.

As the premier user's group in the country, I fell that SP (In conjunction with ISC & other user groups) is in an excellent position to to attempt to redress the situation. I would like to see an open letter to the nation's software and hardware manufacturers toinclude CompuColor in their desings. I feel that if they were more aware of our potential market, they would actually seek it. These letters could appear in some of the most widely read computer magazines, Interface Age, Bits and Bytes, Datamation, Personal Computing, etc. These advertisements could be paid thru a special assesment of the members of the user's groups and perhapsa grant from ISC.

Computer owners are selfish because of their large investment. I believe that if they were approached with this in mind, the response would be moderate to fair. Perhaps the assessment could be in the form of the difference between your normal discount for software and the true retail price.

I have purchased all of the back issues of your excellent bulletin. The back issues contain more that enough information to to cover the cost many times over. I sell my time at $30/hr and these issues have saved me at least 20 hours so far. A $600 return for an $80 investment is more than fair.

I have noticed severalarticles on using hardware handshaking to drive printers, but not one work on software handshaking. I routinely drive my heathkit printer at 4800 Baud with an unmodified CompuColor.

Handshaking simply means that after receiving a character the printer outputs a signal that signifies whether or not the printer is ready to accept another character. If the answere is yes then the computer outputs another character. If the answere is no the computer waits till the answere is yes. Almost all printers (Heathkit Qume, Diablo, Centronics) so that the data line transmits a control code. This is in addition to any RTS or CTS lines. These codes are generally ASC 17 = Clear To Send & ASC 19 = Busy. Asc 17 to 20 are designated, Device Control. CompuColor recieves thes codes at port 0.

There are two basic stratagies to be used with software handshaking. Both utalize the Basic function Inp (0) .

The first subroutine is a simple delay loop. It is useful for printing numeric values which are transmitted as one character.

```
40000  Rem  WAIT  FOR  PINTER
44100  ANSER  =  INP  (0)
44200  IF  ANSER  <>  17  THEN  GOTO  44100
44300  RETURN
```

This code is an Endless Loop. It will not return untill it recan ASC 17.

The second subroutineis used for transmitting strings up to 255 characters. The limitation of 255 is due to Basic's inability to address longer strings using a single name. Longer messages can be broken into units prior to transmitting.

```
BUF$  =  STRING  TO  BE  TRANSMITTED:    GOSUB  45000

45000  REM  TRANSMIT  A  STRING
45002  REM  THIS  ROUTINE  SUPRESSES  THE  CARRIAGE  RETURN
45004 REM IN ORDER TO PRINT  MULTIPLE  DATA  ON  THE  SAME  LINE
45006  REM  ISSUE  A  PRINT  TO  TERMINATE  THE  LINE.
45010  FOR  I=  1  TO  LEN  (BUF$)
45020  ANSER  =  INP  (0)  :    GET  RESPONSE  FROM  EXTERNAL
45025 IF ANSER <> 17 THEN GOTO  45020  :    REM  TEST  AND  LOOP
45030  PRINT  MID$(BUF$,  I,  1)  ;  :    REM  NOTE  SEMICOLON
40540  NEXT  I
45050  BUF$  =  "  ":    REM  NUL  BUF$
45060  RETURN
```

Both of thise routines contain the same LESS LOOP, and both are dependent upon receiving ASC 17 as a clear to send signal.

a simple way to determine the proper code used for CLS is to insert;

```
               PRINT ANSER
```

Following ANSER = INP (0) . A variety of codes will be printed. However the one which appears most frequently will probably be the CLS code.

One final note. When a printer first comes on line the data channel contains garbage. This should be cleared with a PRINT lstatement prior to adressing thise subroutines.

MARK LO CHIANO

University of Waterloo

CONCORDIA CUM VERITATE

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Stan Pro
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U.S.A.

Dear Mr. Pro:

The enclosed diskette contains a utility program that I find very useful when programming in BASIC. The program is written in machine code and then processed by a BASIC program into a relocatable module. The module is ´restored´ by a BASIC program to reside below the last defined top of memory location.

There are three parts to the utility routine, a GETTKEY subroutine, a screen printer and sequential file access routines. The GETKEY routine is the familiar one that has appeared in many other programs and returns the decimal value of the key that was pressed. The screen printer does what CONTROL X is supposed to do. It prints the contents of the screen starting at 7000Hex to the last defined visible cursor position. Characters that have the A7 ON bit set print only on the odd numbered lines. This eliminates the double printing that would normally occur. Chracters with the plot bit set are reproduced as the character "*", thus boxes, etc, will be reproduced on the hardcopy. The third and most complex routine gives the BASIC programmer access to sequential file routines. Therefore, any files that were created by the text editors may be edited, merged, etc, from a BASIC program.

As the syntax for sequential files is a little strange, the following paragraphs serve as a user´s guide to the program.

The BASIC program named RESTOR.BAS must be loaded and run to bring the module SEQFIL.REL into memory. Once loaded, the program will check to see if the top of memory has changed, if the top of memory has changed, SEQFIL.REL will be re-loaded and relocated below whatever was moved into hi-memory.

The following commands are available via the CALL function from BASIC:

0 = open a sequential file for input (read).
1 = open a " " for output (write).
2 = get a record terminated with a CRLF (carriage return linefeed). The CRLF will be truncated from the returned record.
3 = put a record to the file terminated with a CRLF.
4 = close a file.
5 = copy the screen image to a printer.
6 = return the value of the key just pressed.

The syntax for the CALL function is:

```
X = CALL(N) (N1$,N$)
```

Where X = the return code of the operation just performed.
X = 0 for a good read, write, get, put, print.
X = the value of the key for CALL (6)("","") .
X = 12 when the end of file is reached.
X = 10 for a record overflow. This condition will occur when the routine tried to get a record that was longer than the 255 byte buffer string (no CRLF was found at the end of the record). The next CALL (2)(,) will return the balance of the record.
X = 18 for an FCS read or write error.

Where N = one of the values from the table above.

For sequential files when N = 0 or 1:
N1$ = a valid FCS <drive:> file name <.extension>
The default extension is .SRC
N2$ = a 255 byte string that will be used as the file parameter block and the block buffer.

when N = 2:
N1$ = is a 255 byte string in which the next record of the file without a CRLF or formfeed is returned.
N2$ = the 255 byte FPB previously defined.

when N = 3:
N1$ = the record to be put into the file with a CRLF (length = 2=> length <=255).
N2$ = the 255 byte FPB defined for previously output.

when N = 4:
N1$ = a null (N1$ has no meaning but must be present to satisfy the syntax).
N2$ = the 255 byte FPB of the file to be closed.

For screen copy and GETKEY when N = 5 or 6:

N1$ and N2$ = a null (N1$ and N2$ have no meaning, but must be present to satify the syntax).

The immediate mode statements below will demonstrate the use of sequential files a bit more clearly (I hope!). The CALL vector must have been previously set to the start address of the routine.

a) Define a 255 byte string to be used as the FPB and input string buffer.

```
BU$=" ":FOR  I=1  TO 7:BU$ = BU$ + BU$:  NEXT I:  BU$  =  BU$  +
LEFT$(BU$,127)
```

```
F1$  = BU$ + "":  REM FI$ MUST BE COPIED WITH A NULL OR  ALL  THE
FPB´S WILL BE POINTING AT THE SAME FPB AND DISASTER WILL STRIKE.

X = CALL (0)("TEXT1",F1$) : REM OPEN THE FILE TEXT1 FOR INPUT

IN$ + BU$ + "" : REM SET UP THE INPUT BUFFER.

X  = CALL (2)(IN$,F1$) :  REM GET THE FIRST RECORD OF THE FILE IN
IN$.

PRINT IN$; : REM IN$ HAS NO CRLF, SO YOU CAN PRINT AND HANG (;)
```

This next statement will get the rest of the file and print it to the screen.

```
FOR I = 1 TO 2 STEP 0:  IN$ = BU$+"": X = CALL (2)(IN$,F1$): IF X
<> 12 THEN PRINT IN$ : NEXT I
```

The same form may be used to PUT a record to a file, except the copy does not have to made for the output string, but a CRLF must be added to the output string.

There may be as many open files that will fit into the string space that was defined with the CLEAR NNNN statement. Each open file requires string space for a 255 byte FPB and a transient 255 byte input buffer string that may be copied for each call. If string space is tight, the copy process may use the same string as long as the +"" is included. i.e. BU$ may be used as the transient string buffer if it is first copied with an IN$ = BU$ + "". Therefore, string space required is equal to the number of open files times 255 plus 255.

The seqential files routines are particularly handy when the final size of a file is not known such as address lists, letters, etc, also when you want to merge two source files or extract portions of source files for further processing.

The program called CREATE.BAS is a short BASIC program that creates the relocatable module .REL. The program performs much the same as the program supplied by Intecolor on their DEBUG disk, but creates a file that may be loaded and relocated by BASIC. There are some obvious limitations, extremely long programs take a long time to load and programs that have large data areas at the end will require that the programmer inform the restoring program that additional space is required for the data area.

The program CREATE requires that there be two identical copies of the .PRG program to be relocated on the default drive. The .PRG files must be identical but ORGed at two different locations.. The displacement is not critical, only that they be different.

The output file will have the same name as the .PRG file with a file extension of .REL.

The .REL file is brought back into memory with the RESTOR.BAS program. The programmer will have to insert the file name of the .REL module that is to be restored as well as the first two bytes of the .PRG program. This is just a simple comparison check to see if the program is presently in memory. More values may be added as you see fit.

If a start address was used that is different than the load address, this address will be the one used to set the CALL vector.

No attempt has been made to optimize the BASIC programming, but comments have been added so that programmers may modify them to their hearts content.

I hope you find the program interesting and of some value to you and your readers.

Sincerely

Carl Hennig
Language Laboratory Dept.
The University of Waterloo
University Ave. W.
WATERLOO, Ontario, N2L 3G1
CANADA

(FROM PAGE 8)

FOR A FASTER LINE CHANGE 25 TO PLOT2:PLOTX:PLOTY:PLOT

ANOTHER GOOD "WEAPON" IS THE ZAP!

HERE ARE TEN ZAPS

```
10 FOR I = 1 TO 10
20 PLOT 22: PLOT 2: PLOT 155: PLOT 20: PLOT 242: PLOT 20: PLOT 189: PLOT 255
30 FOR Z = 1 to 100: Z=Z+1 : NEXT Z : REM PERSISTENCE ~~INTEVAL~~ INTERVAL OF ZAP
40 PLOT 30: PLOT 2: PLOT 155: PLOT 20: PLOT 242: PLOT 20: PLOT 189: PLOT 255
50 PLOT 29
60 FOR Z = 1 TO 400: Z = Z+1 : NEXT Z
70 NEXT I
999 END
```

Denny Hugg
Data Path Programming, Inc.

S.P. Electronic Systems
5250 Van Nuys Blvd.
Van Nuys, Calif. 91401

4 Sept. 1979

Dear Stan,

Here's a pair of discs with some things I have recently finished. One disc has games, displays, and a couple of general interest educational type programs for children. The other disc is a micro-computer poll concerning soil subsidence, a problem here in the river delta. This is a 4 part linked series of questions. Each part saves the responses in an array on the same disc. A series of short programs are included for house-keeping. Also included are two programs that were used to output the data from the arrays over a modem to an IBM 360 for formatting and printing. The questions won't be of interest to most, but if the questions were changed, the vehicle is an easily used 'questionnaire' program.

In return, if the exchange is still viable, I badly need a MDFRMT machine language program, among others. My only one was for DISC BASIC and it was zapped accidently during the ten day survey I conducted. Make it the one for BASIC 8001 if you have that one.

I should come up with some more stuff soon. I'm 3/4 finished with a tutorial simulation of the fire control radar on the F4C Phantom II, and half done with a game/teaching program called TIME MACHINE, to slyly slip a little history, anthropology, and geography into the heads of my two sons.

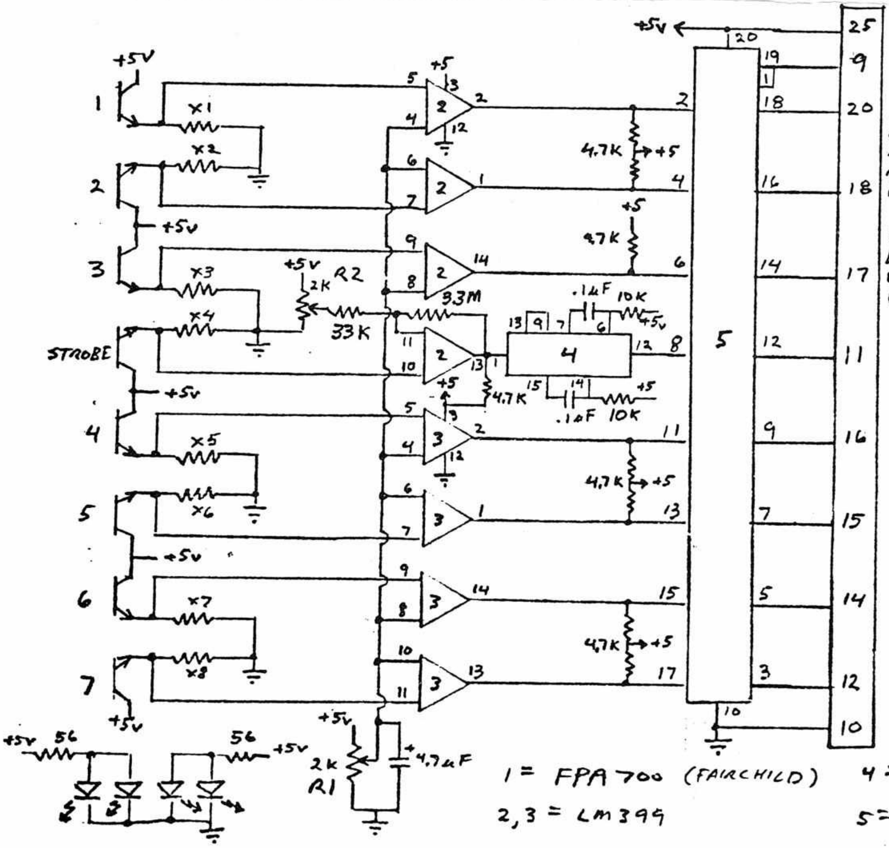
Don't get discouraged; keep it up! All compucolor owners need the Users' Group.

Sincerely,
Denny Hugg

COMPUCOLOR PAPER TAPE READER

To send data between computers with different operating systems ASCII paper tape is still the simplest and most reliable method. This reader uses photo transistors to read 7 bits and the strobe, the parity bit is not read because in most systems it isn't used. Four LEDS are used to illuminate the detectors. A metal box holds the LEDS and shields the detectors from ambient light. The unit is built on a vector board, wires are used to guide the tape, the tape is pulled by hand at a slow to moderate speed. Resistors ,X1 - X8, (470 - 1K) are selected so that one threshold level, adjusted by R1, will work for all detectors. Resistor R2 is used to adjust the threshold for the strobe. It is best to use an oscilloscoope for these adjustments. This unit is connected to the keyboard port. Basic is too slow to read reliably, the machine language program below should be used. Put 224,255 in locations 33282,3 (call jump vector). A=call(B) puts one character in A, B is a dummy variable. It's best to read & store data, if Basic print statements are used the program may become too slow.

ALAN FARIS



```
ORG FFE0
MVI A,64
OUT 7          SET UP PORT
IN 1           READ PORT 1
RLC            SHIFT LEFT
JNC FFE4       IF 0 LOOP
IN 1           READ PORT 1
RLC            SHIFT LEFT
JC FFEA        IF 1 LOOP
IN 1           READ PORT 1
MOV E,A        DATA → E
MVI D,00       00 → D
RET
```

POKE STARTING AT 65504
62,64/211,7/219,1
7/210,228,255/
219,1/7/210,234,255
219,1/95/22,0/201

1 = FPA 700 (FAIRCHILD)
2,3 = LM 399
4 = 74LS221
5 = 74LS244

S.P. DISK #32 GRAPHICS 2

$35.00

THIS GRAPHICS DISK CONTAINS 17+ GRAPHIC PROGRAMS DESIGNED TO BE BOTH INTERESTING AND TO TEACH THE USER DIFFERENT TECNIQUES OF GRAPHICS. BY EXAMING THE LISTING OF THE PROGRAMS ON THIS DISK ONE CAN SEE HOW DIFFERENT TYPES OF ANIMATION ARE ACHIEVED.

1 -COLR64 64 COLOR DISPLAY
2 -WALK3 ANIMATED WALKING FIGURE.
3 -VENN COLOR DISPLAY USING VENN ADDITION.
4 -BOTTLE ANIMATED BOTTLE POURING LIQUED.
5 -GRAPH LISAJOU PLOT.
6 -CASTLE ANIMATED CASTLE DISPLAY. EXCELLENT FOR CHILDREN.
7 -SCR PLOT CHARACTERS IN COLOR.
8 -KLD32C A 32 COLOR KALIDASCOPE, VERY GOOD.
9 -RANBOW DISPLAYS COLORS IN THE RAINBOW.
10-SLYUC DIVIDES SCREEN INTO VERTICAL AND HORIZONTAL BARS.GOOD
11-ARTIST COMPUTER ART BASED ON INPUTED VALUES.
12-COLOR EXCELLENT DISPLAY OF HOW 64 COLORS ARE MADE UP.
13-RORSCH RANDOM COLOR PATTERS LIKE A RORSCH CHART, VERY GOOD.
14-KAL CONFETTI KALIDASCOPE.
15-YINYAN KOREAN YING-YANG DISPLAY.
16-PERSP 3D BOXES.
17-SKETCH USES NUMBER PAD TO CREATE GRAPHICS UNDER CONTROL. EXCELLENT GRAPHICS PROGRAM.
18-CHSDSP KILROY IS HERE.

S.P. DISK #48 EDUCATION 3

$35.00

THIS DISK CONTAINS A GROUP OF EDUCATIONAL PROGRAMS USED BY A HIGH SCHOOL AND PRIVATE TUTORING SYSTEM. THE GRADING PROGRAM CONTAINS A NUMBER OF EXAMPLES TO DEMONSTRATE HOW THE PROGRAM OPERATES. A NUMBER OF FICTICIOUS NAMES HAVE BEEN USED AND ANY RESEMBLENCE TO LIVING OR DECEASED PERSONS IS PURELY ACCIDENTAL.

1 -FLASH LEARN TO SPEED READ. ALL SORTS OF PHRASES TONGUE TWISTERS, NURSERY RHYMES AND WORDS. SPEED IS VARIABLE.

2 -SPELER PRESENTS WORDS IN VARIOUS FORMS,(MISPELLED, MISSING LETTERS AND SCRAMBLED).

3 -GRADER A MULTI SEGMENTED GRADING PROGRAM. ENABLES AN INSTRUCTOR TO; SET UP A NEW CLASS, ADD OR DELETE . A STUDENT, ENTER A CLASS SET OF SCORES, ENTER MAKE UP SCORES, CALCULATE GRADES, AND SET UP A CLASS FOR THE NEXT QUARTER. EACH STUDENT'S GRADE, POSSIBLE SCORE, PERCENTAGE AND LETTER GRADE (FROM A TABLE.) IS PRESENTED. THE NUMBER OF STUDENTS WITH EACH GRADE IS TABULATED AND THE STUDENTS NAMES MAY BE SORTED AND PUT IN GRADE ORDER. THIS PROGRAM IS VERY WELL ILLUSTRATED AND THOUGHT OUT. A NUMBER OF SAMPLE ARRAYS ARE INCLUDED FOR LEARNING HOW TO USE THE PROGRAM.

SP #62 BUSINESS #7

WORD PROCESSOR

\$120$^{\underline{00}}$ + LICENSE

THIS WORD PROCESSOR CONSISTS OF TWO PARTS

1-TEXT EDITOR
THE WORDPRO IS SIMILER TO ISC'S SCREEN EDITOR EXCEPT SOME INTERESTING FEATURES HAVE BEEN ADDED. IT DOES NOT REQUIRE THE 117 KEY KEYBOARD, HAS BLOCK MOVE, COPY, AND DELETE, SEARCH, REPLACE AND AUTOMATIC REPEAT ON ALL KEYS. THE USE OF LOWER CASE CHARACTERS IN MACHINES NOT SO EQUIPPED HAS BEEN MADE POSSIBLE VIA THE JUDICIOUS USE OF COLOR. MANY OTHER FEATURES HAVE BEEN ADDED.

TO LOAD ENTER 'RUN WRDPRO' IN FCS

2-PRINTER DRIVER
THE PRINT DRIVER IS DESIGNED TO OPERATE AT 9600 BAUD SO AS TO OBTAIN THE MAXIMUM OBTAINABLE SPEED FROM A PRINTER. AMONGST THE FEATURES OF THE PRINT DRIVER ARE IT'S ABILITY TO
A-SET A VARIABLE PAGE WIDTH (RIGHT MARGIN)
B-SET A LEFT MARGIN
C-ADD THE TAB FUNCTION
D-SET THE NO OF LINES PER PAGE
E-GO TO CONTINOUS SCROLLED PRINTOUT
F-RIGHT JUSTIFY (FOR SPEED THIS IS DONE BY AN ASSEMBLE LANGUAGE SUBROUTINE
G-NUMBER PAGES
H-SET THE FIRST PAGE TO A NUMBER OTHER THAN ONE (1).
I-SKIP PAGES IN A FILE (THIS IS IMPORTANT TIME SAVER WHEN IT IS NECESSARY TO START PRINTING IN THE MIDDLE OF A FILE
J-ENTER SPECIAL ESCAPE CODES (TO OBTAIN SPECIAL PRINTER RESPONSES.

TO RUN ENTER 'AUTO'

SPECIAL VERSIONS OF THE ABOVE PROGRAMS CAN BE WRITTEN TO ORDER.

S P ELECTRONICS DISK #59 GAMES 7

$30.00

(1) MINE FEILD-MANUEVER YOURSELF THROUGH A DEADLY MINE FIELD

(2) COLORTONE-CAN YOU REMEMBER ALL THE COLORS & TONES ?? THIS PROGRAM IS EQUIPPED WITH SOUND.

(3) FIGHTER-STAR WARS TARGET SHOOT, (CAREFUL THEY SHOOT BACK

(4) ROMBOM-ROMULON BOMB GAME FOR CHILDREN

S P ELECTRONICS DISK #60 GAMES 8

$35.00

(1)FARGONE-A MULTI LEVEL CHESS PROGRAM THAT CAN BE UNBEATABLE. (YOU SHOULD LIVE SO LONG.) AT LOWER LEVELS EACH MOVE IS MADE IN SECONDS, AT HIGHER LEVELS IT CAN TAKE CENTURIES. THE LEVEL OF DISPLAY IS ALSO CONTROLABLE. AT HIGHER LEVELS THE TIME PER MOVE MAY BE EXCESSIVE BUT THE COMPUTER PLAYS A FORMIDABLE GAME AT LEVEL 2 OR 3 AND WILL NOT BE SUCKERED INTO FOOL'S MATE.

REPORTS ON THE SKILL OF THE GAME WILL BE APPRECIATED.

(2) ATTACK!-SAVE EARTH FROM THE ALIENS. SIMILER TO INVADER BUT JUST ONE SAUCER AT A TIME. VERY GOOD.

(3) FIGHTER-STAR WARS TARGET SHOOT, (CAREFUL THEY SHOOT BACK)

(4) HOCKEY-HOCKEY TYPE GAME WITH SCREEN SCROLL

(5) ROMBOM-ROMULON BOMB GAME FOR CHILDREN

S.P. DISK #61 INVADERS

$ 35.00

GAMES 9

BATTLESHIP
THIS IS AN EXTENDED VERSION OF BATTLESHIP. GAME ALLOWS FOR 1 OR 2 PLAYERS. PLAY IS EXECUTED ON AN ENLARGED 26 X 10 GRID

TIC TAC TOE
THIS IS AN EXCELLENT IMPLEMENTATION OF TIC TAC TOE FOR THE COMPUCOLOR. 1 OR 2 PLAYERS ALLOWED.

INVADERS
THE POPULAR 'SPACE INVADERS' COMES TO COMPUCOLOR AT LAST! HIGH SPEED ASSEMBLY LANGUAGE IMPLEMENTATION WITH SOUND AND SUPERB GRAPHICS AND ANIMATION. YOU WILL BE PLAYING IT FOR HOURS.

READY

S.P. DISK 63 HEALTH #1

PRICE $25.00

RUN PROGRAM

1. DISPLAY GRAPH OF MILES RUN TO DATE
2. ENTER MILES FOR NEXT WEEK
3. EDIT GRAPH FOR PREVIOUS WEEKS
4. ENTER DATES FOR GRAPH COORDINATES
5. REVIEW DATA
6. ENTRIES COMPLETE - EXIT PROGRAM

AN EXCELLENT PROGRAM WITH VERY FINE GRAPHICS

COMES COMPLETE WITH SAMPLE DATA

DATE CONVERSTION TO DATE INTERGER (DATING)

1. CONVERT DATE TO AN INTEGER
2. CONVERT AN INTEGER TO A DATE
3. DAY NUMBER IN THIS YEAR
4. DAYS REMAINING THIS YEAR
5. DATE N DAYS FROM TODAY (+ OR -)
6. ADD (+ OR -) DAYS TO ANY DATE
7. NUMBER OF DAYS BETWEEN TWO DATES
8. DAY IN YOUR LIFE
9. CONVERT DATE TO JULIAN DATE
10. CONVERT JULIAN DATE TO DATE

A VERY USEFUL PROGRAM. USEFUL FOR BOTH BUSINESS AND BIORYTHM CALCULATIONS

PRINTER NOTES

WHAT'S THE MATTER WITH YELLOW PROGRAMS? WELL, THE PRINTER CONTROL OPTION, IF YOU PAY FOR IT, ALLOWS THE PROGRAM TO SELECT 4 CHARACTER WIDTHS (AND PROVIDES THE CAPABILITY FOR AUTOMATIC LINE FEED, WHICH I ALWAYS LEAVE OFF). IT ALSO ALLOWS YOU TO REMOTELY DESELECT THE PRINTER BY SENDING AN ASCII 19, WHICH TURNS THE PRINTER OFF UNTIL IT RECEIVES AN ASCII 17. THAT'S NICE, BUT COMPUCOLOR USES ASCII 19 FOR THE YELLOW KEY. THAT'S RIGHT, IF YOU LIST A PROGRAM THAT HAS ANY YELLOW IN THE REMS OR INSIDE QUOTES, IT WILL STOP PRINTING AND WON'T START AGAIN UNTIL YOU SEND SOMETHING RED. I SUGGEST USING ANOTHER COLOR IN YOUR REMS FOR HIGHLIGHTING, AND CHANGING YELLOW WITHIN QUOTES TO 'CHR$(19)'. USE 'PLOT 6,3' TO PRINT YELLOW TO THE CRT, BUT STILL ALLOW THE PROGRAM TO RUN IF THE OUTPUT IS DIRECTED TO THE PRINTER. FREDI (COMPUCOLOR'S BASIC EDITOR) WILL LIST AND SEARCH FOR YELLOW KEYS IN YOUR EXISTING PROGRAMS. IT IS A GOOD IDEA TO ALWAYS USE 'PRINT CHR$(17);' AFTER SELECTING THE RS-232C INTERFACE FOR THE FIRST TIME IN A PROGRAM; IF A PREVIOUS PROGRAM ERROR OR GLITCH CAUSES THE PRINTER TO DESELECT, YOU WON'T THINK THE PRINTER IS BROKEN.

A FINAL NOTE: ASCII CODES 28 TO 31 (CURSOR UP, FLAG OFF, FLAG ON, BLINK ON) WILL CAUSE THE CHARACTER WIDTH TO CHANGE WHEN LISTING A PROGRAM, BUT IT WILL STILL BE LEGIBLE.

S.P. DISK 64 HEALTH #2

PRICE $25.00

LIFE EXPECTANCY PROGRAM

THIS PROGRAM TAKES SUCH FACTORS AS YOUR AGE, SEX, DRINKING, AND AND SMOKEING HABITS AS WELL AS MANY OTHER FACTORS INVOLVED IN YOUR LIFE STYLE TO COMPUTE YOUR PROBABLE LIFE EXPECTANCY. THE PROGRAM IS VERY GOOD AND PROBABLY HAS SOME SUPRISES FOR YOU.

DIET

THIS PROGRAM IS ONE OF A SERIES WE WILL BE RELEASING THAT HAVE BEEN WRITTEN BY MEDICAL DOCTORS. THE DOCTOR WHO PUT THIS PROGAM TOGETHER COULD HAVE DONE QUITE WELL AS A PROGRAMMER. THIS IS REALLY A GOOD ONE. IT TAKES TAKES IN TO ACCOUNT SUCH FACTORS AS HOURS SLEEPING STANDING, WALKING, IN ACTIVE EXERCISE AND WHATEVER AND THEN COMPUTES THE NUMBER OF CALORIES YOU NEED TO MAINTAIN YOUR WEIGHT. IT THEN GOES ON TO ASK YOU HOW MUCH WEIGHT YOU WANT TO LOSE OVER HOW LONG A PERIOD AND COMES UP WITH A CALORIE SCHEDUAL FOR YOU.

IN ADDITION OTHER INTERESTING DIET INFORMATION IS INCLUDED.

HELLO

SILLY BUT INTERESTING PSHYCHOLOGIST TYPE PROGRAM SIMILER TO ELIZA MUCH SHORTER BUT GOOD FOR A LITTLE FUN ANYWAY

S.P. DISK 65 GAMES #10

PRICE $30.00

TRAP PROGRAM

A SIMPLIFIED VERSION OF SNAKE THAT RUNS IN BASIC AND CAN RUN ON ANY VERSION OF SOFTWARE

RESCUE

THE IDEA OF THIS GAME IS TO CATCH A FALLING AIRCRAFT. YOU CAN MOVE HORIZONTALLY OR VERTICALLY. THIS AND THE GAME ABOVE WERE SUBMITTED BY A MEMBER IN GERMANY.

ASTEROIDS

THERE ARE TWO VERSIONS OF THIS GAME. THE BASIC DIFFERENCE IS IN THE WAY YOU SHOOT AT THE METEORS. ONE VERSION IS AST1 AND THE OTHER IS AST2. BE SURE YOU LOAD AND RUN THEM PROPERLY. IN ADDITION TO THE ASSEMBLY LANGUAGE PROGRAMS THERE IS A BASIC CONTROL PROGRAM CALLED 'INSTR' AND TWO DISPLAYS WHICH ARE LOADED BY INSTRA. THE TWO DISPLAYS CARRY THE COMPLETE INSTRUCTIONS FOR ASTEROIDS.
THE GAME IS CAPABLE OF 9 LEVELS OF PLAY(THEORETICALLY) BUT YOU WILL DO WELL TO SURVIVE LEVEL 4 WITH 16 PIECES FLOATING AROUND THE SCREEN. THIS HAS TO BE LISTED AS ONE OF THE BETTER GAMES FOR THE COMPUCOLOR.